AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

1. (Currently Amended) A method for quantifying the performance of a component~~,~~ ~~comprising: a component adapted~~ configured to function as a node in a communications network, the method comprising:

sending an information unit (A) with a certain payload (P) by at least one computing unit through the component; and

calculating a service time delay (S) for the information unit (A) by the at least one computing unit, wherein ~~where~~ the service time delay (S) for [[an]]the information unit (A) with [[a]]the certain payload (P) is known as the time difference between [[the]]a time of departure (t_d) of said information unit (A) and [[the]]a time of arrival (t_a) of said information unit (A), where a first service time (S_1) is known for a first information unit (A_1) with a first payload (P_1), a second service time (S_2) is known for a second information unit (A_2) with a second payload (P_2), and so on to a last information unit (A_n) with a last payload (P_n) in a stream of payloads, and where [[the]]an incremental step (IS) of payload between said first, second and following information units (A_1, A_2, .., A_n) is predefined, wherein said component is represented by a virtual distance (x) according to the following formula:

$$x = v_1 \cdot S_1 = v_2 \cdot S_2 = \cdots = v_i \cdot S_i = v_{i+1} \cdot S_{i+1} = \cdots = v_n \cdot S_n$$

wherein the virtual distance x is a constant distance for a given component,
that v_i corresponds to a virtual speed with which an information unit (Ai) with a specific payload P_i travels;

wherein S_i corresponds to the time taken to travel said distance x with the speed v_i, S_i being the service time for an information unit A_i with payload P_i;

wherein the speed v_i is represented by:

$$v_i = \left[\frac{S_{i+1}}{S_i} - 1 \right] \cdot IS^{-1}$$

wherein the constant distance x thus is represented by:

$$x = \frac{S_{i+1} - S_i}{IS}$$, and,

wherein the virtual distance x is a representation of a metric that relates to intrinsic properties of said component, allowing said quantification of said component.

2. (Currently Amended) The method according to Claim 1, wherein said component is represented by two distances:

a first distance $_{a}x$ representing said component in a first sense, meaning that as said information units arrive to said component through a first interface and ~~departs~~ depart from said component through a second interface~~, such as uplink communication, and~~; and

a second distance $_{b}x$ representing said component in a second sense, meaning that said information units arrive to said component through said second interface and ~~departs~~ depart from said component through said first interface~~, such as downlink communication~~.

3. (Currently Amended) The method according to Claim 1, wherein if said component has a number of usable interfaces [[(,]] then said component is represented by two distances, meaning two senses, for every possible combination of interfaces.

4. (Currently Amended) The method according to Claim 1, wherein said service time delay (S) is a part of [[a]]the component's total response time (R), and wherein ~~that~~ the response time (R) is a sum of said service time delays (S) and a waiting time (W), whereby $R_i = t_{di} - t_{ai}$, whereby if $t_{ai} \geq t_{d(i-1)}$ then $W_i = 0$ and $S_i = R_i$, and whereby if $t_{ai} < t_{d(i-1)}$ then $W_i = t_{d(i-1)} - t_{ai}$ and $S_i = t_{di} - t_{d(i-1)}$.

5. (Currently Amended) The method according to Claim 1, wherein service time delay (S) comprises the time to process, to check for errors and to transmit an information unit (A), and wherein ~~that~~ the time to process an information unit includes ~~may include any~~ management time and other delays relating to network specific details.

6. (Currently Amended) The method according to Claim 1, wherein statistical methods are used to obtain values for service ~~times~~ time delay (S), and thus virtual speed (v), representing information units (A) with different payloads (P), and virtual distance (x) representing said component~~, with sufficient accuracy and certainty~~.

7. (Currently Amended) A system for quantifying the performance of a component adapted to function as a node in a communications network, said system comprising:

a first computing unit connected to said component by means of a first interface (1a);

a second computing unit connected to said component by means of a second interface;

where said first computing unit adapted to send an information unit (A) with a certain payload (P) to said second computing unit through said component;

a third computing unit adapted to passively calculate the service time delay (S) for said information unit (A) by using the information obtained by measuring the time difference between the time of departure (t_d) of said information unit (A) from said component and the time of arrival (t_a) of said information unit (A) to said component;

said first computing unit adapted to send a stream of information units where the incremental step (IS) of payload between a first, second and following information units (A_1, A_2, …, A_n) is predefined;

said third computing unit adapted to measure a first service time delay (S_1) for a first information unit (A_1) with a first payload (P_1), a second service time delay (S_2) for a second information unit (A_2) with a second payload (P_2), and so on to a last information unit (A_n) with a last payload (P_n) in said stream of information units, wherein said component is represented by a virtual distance x, said third computing unit adapted to calculate said virtual distance according to the following formula:

$$x = v_1 \cdot S_1 = v_2 \cdot S_2 = \cdots = v_i \cdot S_i = v_{i+1} \cdot S_{i+1} = \cdots = v_n \cdot S_n;$$

said virtual distance x is a constant distance for a given component, that v_i corresponds to a virtual speed with which an information unit (A_i) with a specific payload (P_i) travels, that S_i corresponds to the time taken to travel said distance x with the speed v_i, S_i being the service time for an information unit A_i with payload P_i;

the speed v_i is represented by:

$$v_i = \left[\frac{S_{i+1}}{S_i} - 1\right] \cdot IS^{-1}$$

the constant distance x thus is represented by:

$$x = \frac{S_{i+1} - S_i}{IS}$$, and

said third computing unit adapted to present the virtual distance x as a representation of a metric that relates to intrinsic properties of said component, thus providing said quantification of said component.

8. (Currently Amended) The system according to Claim 7, wherein said third computing unit is adapted to calculate two distances representing said component:

a first distance $_{a}x$ represents said component in a first sense, where said first computing unit is adapted to send information units to said second computing unit through said component, such as uplink communication; and

a second distance $_{b}x$ represents said component in a second sense, where said second computing unit is adapted to send packets to said first computing unit through said component~~,~~ ~~such as downlink communication~~.

9. (Currently Amended) The system according to Claim 7 wherein if said component has a number of usable interfaces, then said first and second computing units are adapted to communicate with each other through said component through every possible combination of interfaces, and ~~that~~ wherein said third computing unit is adapted to calculate and present two distances representing said component, meaning two senses, for every possible combination of interfaces.

10. (Currently Amended) The system according to Claim 7, wherein said third computing unit is adapted to extract said service time delay (S) from the total response time of said component, where the response time (R) is a sum of said service time delay (S) and a waiting time (W) of said component, wherein ~~that~~:

$R_i = t_{di} - t_{ai}$, that if $t_{ai} \geq t_{d(i-1)}$ then $W_i = 0$ and $S_i = R_i$, and

~~that~~ wherein if

$$[[-]]\ t_{ai} < t_{d(i-1)} \text{ then } W_i = t_{d(i-1)} - t_{ai} \text{ and } S_i = t_{di} - t_{d(i-1)}.$$

11. (Currently Amended) The system according to ~~any one of~~ Claim 7, wherein said service time delay (S) comprises the time to process, to check for errors and to transmit an information unit (A), and ~~that~~ wherein the time to process an information unit (A) may include ~~any~~ management time and other delays relating to network specific details.

12. (Currently Amended) The system according to ~~of~~ Claim 7, wherein said first and second computing units are adapted to send and receive ~~several~~ a plurality of streams of information units through said component, each stream being sufficiently long to represent information units (A) with different payloads (P), in order to provide said third computing unit with measurement data required to perform statistical methods to obtain values for service ~~times~~time delays, virtual speed and virtual distance ~~with sufficient accuracy and certainty~~.

13. (Currently Amended) A ~~first~~ computer program product, comprising~~: a first~~ computer program code, which, when executed by a computing unit, makes said computing unit operate as the ~~work as a~~ first computing unit according to Claim 7.

14. (Currently Amended) A ~~second~~ computer program product comprising~~: a second~~ computer program code, which, when executed by a computing unit, makes said computing unit operate as the ~~work as a~~ second computing unit according to Claim 7.

15. (Currently Amended) A ~~third~~ computer program product, comprising~~: a third~~ computer program code, which, when executed by a computing unit, makes said computing unit operate as the ~~work as a~~ third computing unit according to Claim 7.

16. (Currently Amended) A ~~fourth~~ computer program product, comprising~~: a fourth~~ computer program code, which, when executed by a computing unit, makes said computing unit perform a method comprising the steps of:

sending an information unit (A) with a certain payload (P) by the computing unit through[[,]] a component adapted to function as a node in a communications network[[,]]; and

calculating a service time delay (S) for the information unit (A) by the computing unit,

wherein ~~where~~ the service time delay (S) for the ~~an~~ information unit (A) with the [[a]] certain payload (P) is known as the time difference between the time of departure (t_d) of said information unit (A) and the time of arrival (t_a) of said information unit (A), ~~where~~ wherein a first service time delay (S_1) is known for a first information unit (A_1) with a first payload (P_1), a second service time delay (S_2) is known for a second information unit (A_2) with a second payload (P_2), and so on to a last information unit (A_n) with a last payload (P_n) in a stream of payloads, and ~~where the~~ wherein an incremental step (IS) of payload between said first, second and following information units (A_1, A_2, .., A_n) is predefined, wherein said component is represented by a virtual distance (x) according to the following formula:

$$x = v_1 \cdot S_1 = v_2 \cdot S_2 = \cdots = v_i \cdot S_i = v_{i+1} \cdot S_{i+1} = \cdots = v_n \cdot S_n$$

wherein the virtual distance x is a constant distance for a given component,

wherein ~~that~~ v_i corresponds to a virtual speed with which an information unit (Ai) with a specific payload P_i travels;

wherein S_i corresponds to the time taken to travel said distance x with the speed v_i, S_i being the service time for an information unit A_i with payload P_i;

wherein the speed v_i is represented by:

$$v_i = \left[\frac{S_{i+1}}{S_i} - 1\right] \cdot IS^{-1}$$

wherein the constant distance x thus is represented by:

$$x = \frac{S_{i+1} - S_i}{IS}$$

and wherein the virtual distance x is a representation of a metric that relates to intrinsic properties of said component, allowing said quantification of said component.

17. (Currently Amended) A single computing unit for quantifying the performance of a component adapted to function as a node in a communications network, wherein the

~~comprising: a said~~ single computing unit is adapted to function as ~~both~~ a first, second and third computing unit comprising:

a first computing unit connected to said component by means of a first interface (1a);

a second computing unit connected to said component by means of a second interface;

where said first computing unit adapted to send an information unit (A) with a certain payload (P) to said second computing unit through said component;

a third computing unit being adapted to passively calculate the service time delay (S) for said information unit (A) by using the information obtained by measuring the time difference between the time of departure (t_d) of said information unit (A) from said component and the time of arrival (t_a) of said information unit (A) to said component;

wherein said first computing unit is adapted to send a stream of information units where ~~the~~ an incremental step (IS) of payload between a first, second and following information units (A_1, A_2, …, A_n) is predefined;

wherein said third computing unit is adapted to measure a first service time delay (S_1) for a first information unit (A_1) with a first payload (P_1), a second service time delay (S_2) for a second information unit (A_2) with a second payload (P_2), and so on to a last information unit (A_n) with a last payload (P_n) in said stream of information units,

wherein said component is represented by a virtual distance x, said third computing unit being adapted to calculate said virtual distance according to the following formula:

$$x = v_1 \cdot S_1 = v_2 \cdot S_2 = \cdots = v_i \cdot S_i = v_{i+1} \cdot S_{i+1} = \cdots = v_n \cdot S_n;$$

said virtual distance x is a constant distance for a given component,

wherein ~~that~~ v_i corresponds to a virtual speed with which an information unit (A_i) with a specific payload (P_i) travels, that S_i corresponds to the time taken to travel said distance x with the speed v_i, S_i being the service time for an information unit A_i with payload P_i;

wherein the the speed v_i is represented by:

$$v_i = \left[\frac{S_{i+1}}{S_i} - 1\right] \cdot IS^{-1}$$

the constant distance x ~~thus~~ is represented by:

$$x = \frac{S_{i+1} - S_i}{IS}$$, and

wherein said third computing unit is adapted to present the virtual distance x as a representation of a metric that relates to intrinsic properties of said component, thus providing said quantification of said component.

18. (Currently Amended) The single computing unit according to Claim 17, wherein said single computing unit comprises [[a]] computer program code, which, when executed by a computing unit, makes said computing unit perform a method comprising the steps of: [[,]]

sending an information unit (A) with a certain payload (P) by the computing unit through a component adapted to function as a node in a communications network[[,]]; and

calculating a service time delay (S) for the information unit (A) by the computing unit,

wherein ~~where~~ the service time delay (S) for [[an]]the information unit (A) with [[a]]the certain payload (P) is known as the time difference between [[the]]a time of departure (t_d) of said information unit (A) and [[the]]a time of arrival (t_a) of said information unit (A), where a first service time delay (S_1) is known for a first information unit (A_1) with a first payload (P_1), a second service time delay (S_2) is known for a second information unit (A_2) with a second payload (P_2), and so on to a last information unit (A_n) with a last payload (P_n) in a stream of payloads, and ~~where the~~ wherein an incremental step (IS) of payload between said first, second and following information units (A_1, A_2, .., A_n) is predefined, wherein said component is represented by a virtual distance (x) according to the following formula:

$$x = v_1 \cdot S_1 = v_2 \cdot S_2 = \cdots = v_i \cdot S_i = v_{i+1} \cdot S_{i+1} = \cdots = v_n \cdot S_n$$

wherein the virtual distance x is a constant distance for a given component,

wherein ~~that~~ v_i corresponds to a virtual speed with which an information unit (Ai) with a specific payload P_i travels;

wherein S_i corresponds to ~~the~~ a time taken to travel said distance x with the speed v_i, S_i being the service time for an information unit A_i with payload P_i;

wherein the speed v_i is represented by:

$$v_i = \left[\frac{S_{i+1}}{S_i} - 1 \right] \cdot IS^{-1}$$

wherein the constant distance x thus is represented by:

$$x = \frac{S_{i+1} - S_i}{IS}$$

and wherein the virtual distance x is a representation of a metric that relates to intrinsic properties of said component, allowing said quantification of said component.

19. (Cancelled)